



OIT's Metalcasting Partnership Portfolio

Materials

- ♦ ZCA-9 Creep Restnt. Alloy Dev.
- ♦ Clean, Machinable thin-walled gray & ductile iron
- ♦ Wave Celerity & Quality of die cast product
- ♦ Surface Eng. Coatings for Dies
- ♦ Age Strengthening of Gray Iron
- ♦ Intermetallic alloy for ethylene reactors
- ♦ Metallic reinforcement in squeeze casting
- ♦ Porosity prevention in Fe casting
- ♦ Heat Treatment - Steel Castings
- ♦ Clean Metal Casting
- ♦ Cast, High Alloy Components Database
- ♦ Improved Grain Refinement
- ♦ Fatigue Properties of Al alloys
- ♦ Steel Macro inclusions atlas
- ♦ Die-casting copper motor rotors
- ♦ Semi-solid Aluminum alloys
- ♦ Real-time Measurement of Melt Constituents
- ♦ Grain refinement in PM copper

Manufacturing

- ♦ Die Life Extension
- ♦ Sensors for Die Casting
- ♦ Advanced Lost Foam Technology
- ♦ RSP tooling in die casting
- ♦ Modeling bead expansion in white side
- ♦ Clean Cast Steel
- ♦ Optimization of Comp. & HT of Die Steels
- ♦ Computer Modeling of Shot Sleeves
- ♦ Energy Consumption in Die Casting Operations
- ♦ Investment Shell Cracking
- ♦ Ergonomic Improvements in Foundries
- ♦ Unconventional Yield Studies
- ♦ Optical Sensor in electric arc steel making
- ♦ Semi-Solid and Squeeze Casting
- ♦ Heat transfer and casting distortion
- ♦ Removal of residual in the steel ladle
- ♦ Advanced Process Control for Steel
- ♦ Rapid Tooling using Optimized Cooling
- ♦ Sand/mold/core enhancements to improve finish
- ♦ High speed measurement of internal die cavity temperature

Products & Markets

- ♦ Development of a Fatigue Properties Database for Modern Design Methods
- ♦ Qualitative reasoning for die casting
- ♦ Thin section steel castings
- ♦ Evaluation of high molybdenum stainless steel
- ♦ Cast particulate metal matrix components
- ♦ Thin-wall iron castings
- ♦ Filtering Molten metal
- ♦ Ceramic composite for metal casting
- ♦ Service performance of duplex stainless steel

Energy

- ♦ High Efficiency, Low NOx Melting
- ♦ Energy Efficient High temperature gas furnace
- ♦ Cupola Sensing & Control
- ♦ Foundry Energy Assessments
- ♦ BestPractices Assessments
- ♦ IAC assessments
- ♦ Steel Foundry Refractory Lining Optimization

Environment & Recycling

- ♦ Reducing foundry emissions and green sand waste
- ♦ Recovery & Regeneration in Heat Treating
- ♦ Foundry Emissions Characterization & Modeling
- ♦ Non-incineration treatment to reduce benzene and VOC emissions

- ♦ Technical data to validate performance of foundry byproducts
- ♦ Flotation melter and scrap dryer
- ♦ Novel method to process furnace dust into saleable product
- ♦ Recover and reuse sulfur dioxide

Metal Casting R&D Investment (million dollars)

Project Type	OIT	Cost-share	Total
Direct	\$15.3	\$17.6	\$32.9
Direct and Related	\$43.8	\$34.7	\$78.5